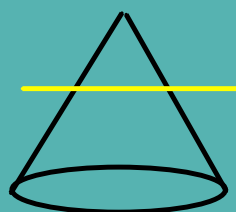
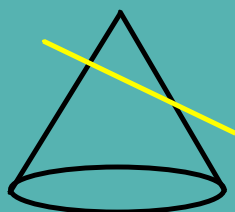


CONIC SECTIONS



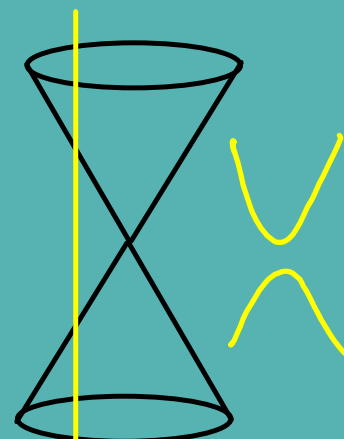
Circle



Ellipse



Parabolas



Hyperbola

General Formulas	Circles
	Parabolas

Ellipse	Hyperbolas

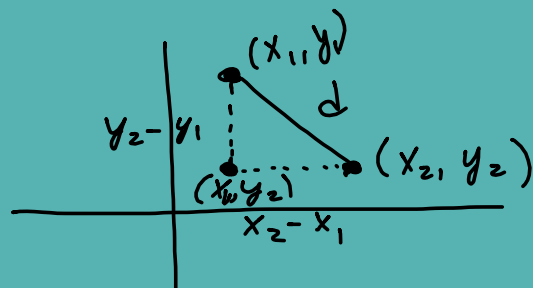
General Formulas

Midpoint Formula

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

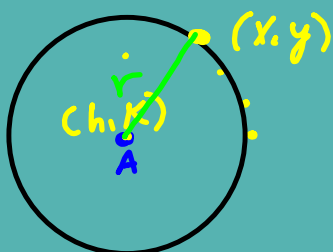
Distance Formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = d$$

CIRCLES - the set of points equidistant from a given point.



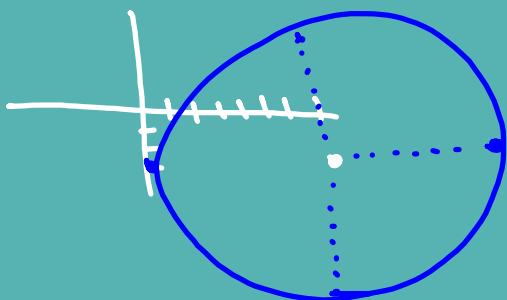
$$\sqrt{(x-h)^2 + (y-k)^2} = r$$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x-7)^2 + (y+3)^2 = 49$$

Center: $(7, -3)$

radius: $\sqrt{r^2} = \sqrt{49}$
 $r = 7$

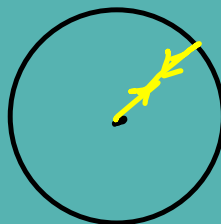


$$(x+13)^2 + y^2 = 24$$

Center: $(-13, 0)$

$$\sqrt{r^2} = \sqrt{24}$$

$$r = 2\sqrt{6}$$



Dishes
 Clocks
 Math Stickers
 Round table
 Circle on floor
 of gym

Circle

$$\frac{2x^2}{2} + \frac{2y^2}{2} + \frac{12x}{2} - \frac{20y}{2} - \frac{4}{2} = 0$$

$$x^2 + y^2 + 6x - 10y - 2 = 0$$

$$x^2 + 6x \underset{+3}{+9} + y^2 - 10y \underset{-5}{+25} = 2 + 9 + 25$$

$$(x+3)^2 + (y-5)^2 = 36$$

Center: $(-3, 5)$

$$\sqrt{r^2} = \sqrt{36}$$

$$r = 6$$

Center: $(-4, 7)$

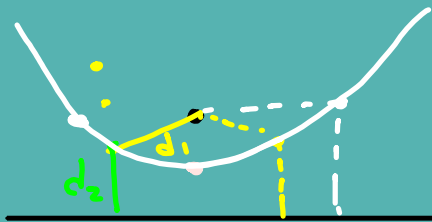
$$\text{radius} = 3\sqrt{2}$$

Write eq. of circle

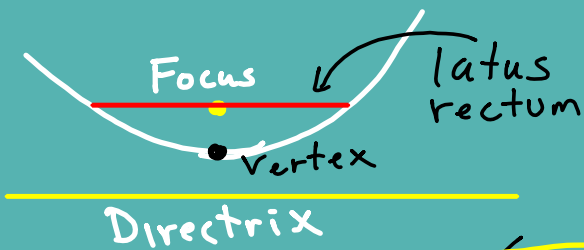
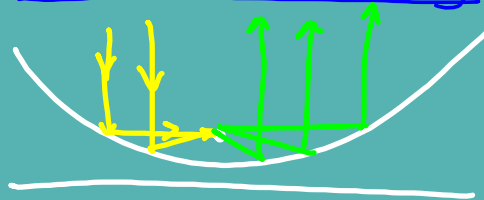
$$(x+4)^2 + (y-7)^2 = (3\sqrt{2})^2$$

$$(x+4)^2 + (y-7)^2 = 18$$

- the set of points equidistant from a given point + a given line.



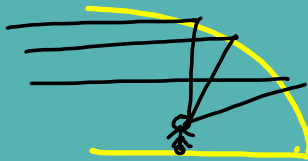
Reflective Property



Satellite dish
headlights

sound device @ football game

amphitheater



FORMULAS

$$y = a(x-h)^2 + k$$

(h, k)

Vertex

line of sym

$$x = h$$

direction

+a up
-a down

focus

$$\left(h, k + \frac{1}{4a}\right)$$

latus rectum $\left|\frac{1}{a}\right|$

$a = 4$
latus = 1/4

$a = \frac{1}{12}$
latus $\left|\frac{1}{1/12}\right| = 1 \cdot \frac{12}{1} = 12$

$$x = a(y-k)^2 + h$$

(h, k)

$$y = k$$

+a right
-a left

$$\left(h + \frac{1}{4a}, k\right)$$

latus rectum $\left|\frac{1}{a}\right|$

$$X = \frac{1}{8} (y-2)^2 + 1$$

$$\text{Vertex: } (1, 2)$$

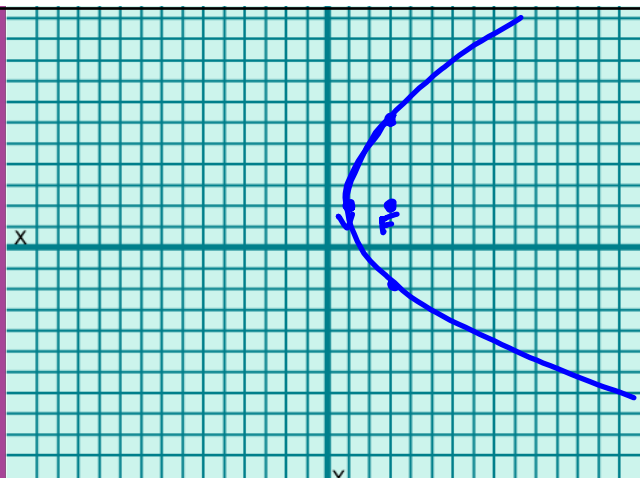
$$\text{line of Symm } y = 2$$

direction $+\frac{1}{8}$ right

$$\begin{aligned} \text{focus: } & (h + \frac{1}{4}a, k) \\ & = (1 + \frac{1}{4}(\frac{1}{8}), 2) \\ & = (1 + \frac{1}{32}, 2) \\ & (1 + 2, 2) \end{aligned}$$

$$\text{Focus: } (3, 2)$$

$$\text{Latus: } \left| \frac{1}{a} \right| = \left| \frac{1}{\frac{1}{8}} \right| = 8$$



To graph:

- 1) Plot vertex
- 2) Plot focus
- 3) Put $\frac{1}{2}$ of latus on each side of focus